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West Nile Virus Guidelines for Horse Owners

By Kathy Anderson, Extension Horse Specialist

West Nile Virus (WNV) is a mosquito-borne virus that can cause encephalitis (inflammation of the brain) or meningitis (inflammation of the lining of the brain and spinal cord) in humans and horses. Mosquitoes that acquire it from infected birds transmit the virus. This virus was first discovered in the United States in New York in 1999 and has quickly spread throughout the United States. By the end of 2002, the virus was found in 44 states and five Canadian Provinces. In 2002, Nebraska reported 174 human cases in 48 counties with eight deaths. More than 14,000 equine cases were reported in the United States in 2002; more than 1,100 were in Nebraska. It is estimated that two to three times more cases occurred than were reported. In comparison, 149 human cases in nine states resulted in 18 deaths nationwide in 2001. That year, there also were 731 equine cases in 20 states with a 25 percent mortality rate. The greatest number of Nebraska cases were in the state's central and western areas. The first Nebraska cases of WNV in horses were reported in early August 2002, with the majority reported between early August and early October.

Transmission

The virus is transmitted when a mosquito acquires it from an infected bird and the mosquito then feeds on a horse, human or other mammal. Many birds can be infected with WNV and not exhibit clinical signs. Crows and blue jays are most likely to die from infection, but the reason why these two species die of WNV is unknown. Any type of bird or mammal may be susceptible. Horses and people are "dead-end hosts," meaning there is no horse-to-horse, horse-to-person or person-to-person virus transmission. Horses and humans do not develop sufficient quantities of virus in their blood to infect mosquitoes that may feed on them. A bite from an infected mosquito will not always make a person or animal sick. Most people with WNV either have no symptoms or experience mild illness. The incubation period for humans is three to 15 days. All people in areas where WNV activity has been identified are at risk, but persons older than age 50 have been shown to have the highest risk of severe disease. Most human infections are mild. Symptoms include fever, headache and body aches, occasionally with skin rash and swollen lymph glands. More severe infections may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis and, rarely, death.

Symptoms in Horses

West Nile Virus causes encephalitis - swelling of the brain and spinal cord. Once a horse has been bitten, it may take five to 15 days for the signs of West Nile Virus to appear. The most common clinical signs in horses are muscle tremors and an altered gait. Other symptoms include loss of appetite, depression, weakness of the hind limbs, partial paralysis, fever, impaired vision, ataxia, head pressing, aimless wandering, convulsion, inability to swallow, circling, hyperexcitability, coma and death. Affected horses may develop a fever 10 days before clinical signs appear. Many of the clinical symptoms are similar to horses with rabies, Equine Protozoal Myelitis (EPM), equine encephalitis and other serious neurological diseases. If symptoms are present, a veterinarian should be contacted immediately. No specific treatment for WNV exists other than supportive veterinary care standard for animals infected with a viral agent. Data has indicated a 30 percent to 40 percent mortality rate.

Prevention

Vaccination

A vaccine is approved for horses but must be administered by a veterinarian. For horses never vaccinated for WNV, the initial vaccine is a two-injection series given three weeks apart. Both injections must be given to provide protection from WNV. Maximum protection occurs three to four weeks after the second injection. If a horse previously received the two-injection series, a single booster within six months of peak mosquito season is recommended. A booster every four to six months during mosquito season is suggested for horses in warmer climates. Foals born to mares that have been vaccinated for WNV should have the two-shot series at 6 months of age (two injections, three weeks apart). If the mare was not vaccinated for WNV, a three-injection series (three weeks apart) initiated at 3 months of age is suggested for foals.

Other equine encephalitic diseases (sleeping sickness: eastern equine encephalitis, western equine encephalitis and Venezuelan equine encephalitis) belong to a different family of viruses for which there is not cross-protection. As a result, horses should be vaccinated specifically for WNV as well as the various forms of equine encephalitis. Horse owners should consider WNV vaccinations one of the standard vaccines.

In a study to determine the effectiveness of the vaccine, a group of horses that had been vaccinated 12 months previously and a group of non-vaccinated horses were given WNV. Eighty-one percent of the non-vaccinated horses developed the disease. Only one of the vaccinated horses developed WNV, so the vaccine was reported to be 94 percent effective.

Mosquito control

Limiting exposure to mosquitoes is fundamental to help prevent the spread of WNV. Reducing the amount of standing water available for mosquito breeding is a key element in mosquito control. Other mosquito control guidelines include:

- Dispose of tin cans, plastic containers, ceramic pots or similar water-holding containers.
- Remove all discarded tires.
- Drill holes in the bottom of recycling containers left outdoors.
- Clean clogged roof gutters.
- Turn over plastic wading pools when not in use.
- Turn over wheelbarrows and don't let water stagnate in birdbaths.
- Aerate ornamental pools or stock them with fish.
- Clean and chlorinate swimming pools when not in use.

- Use landscaping to eliminate standing water that collects.

Steps that can be taken to prevent mosquitos from affecting horses include:

- House horses indoors during peak periods of mosquito activity (dusk and dawn).
- Avoid turning on lights inside the stable during the evening and overnight.
- Place incandescent bulbs around the perimeter of the stable to attract mosquitoes away from the horses.
- Topical preparations containing mosquito repellents are available for horses. Read the product label before using and follow all instructions.
- Fogging of stable premises can be done in the evening to reduce mosquitoes; read directions carefully before using.

Web Sites for More Information

Nebraska Department of Health and Human Services (NDHHS)

<http://www.lhs.state.ne.us/puh/epi/wnv/wnvindex.htm>

U.S. Department of Agriculture, APHIS <http://www.aphis.usda.gov/oa/wnv/index.html>

Center for Disease Control and Prevention (CDC) <http://www.cdc.gov/ncidod/dvbid/westnile/index.htm>

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